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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,979	07/02/2007	Kaneco Chiba	B-6120PCT 623710-0	9332
7550		10/06/2009		
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			EXAMINER	
			CHOI, FRANK I	
			ART UNIT	PAPER NUMBER
			1616	
			MAIL DATE	DELIVERY MODE
			10/06/2009	
			PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/591,979

Applicant(s)

CHIBA ET AL.

Examiner

FRANK I. CHOI

Art Unit

1616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIS)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____
- Paper No(s)/Mail Date 12/11/2006

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The claimed invention is directed to oxygen nanobubbles having a size of 200 nm or less and methods of preparing the same.

Claim 1 rejected under 35 U.S.C. 102(e) as being anticipated by McGrath et al. (US 6,649,145).

McGrath et al. expressly discloses oxygen nanobubbles having a size of 20-30 nm which are prepared by flowing liquids over hydrophobic surfaces (Column 7, lines 43-55).

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/022736 in view of JP 2002-307053, JP 60-122337 and McGrath et al. (US 6,649,145).

WO 03/022736 discloses that the merit of water discharge in the product of an oxygenated water is that production and dissolution of the ozone take place at the same time

(page 4, lines 10-13). It is disclosed that about 2 liters of an ozonated water with 6 mg/l concentration was produced (page 4, lines 15,16). It is disclosed that fine bubble can be produced by a bubble generator (page 9, lines 13-30). An apparatus is disclosed where the water discharge system has two electrodes insulated with at least one dielectric and an insulator body surrounding the metal electrodes, the water discharge system producing through a dielectric barrier discharge the ozone and ozonated water (Claim 1).

JP 2002-307053 disclose the use of ultrasonic vibrations to effect the ozone bubbles (claims, paragraph 0026).

JP 60-122337 disclose the use of a rotation shaft with a screw blade which has thin holes to effect the ozone bubbles (claims, page 3, line 8 to page 4, line 16).

McGrath et al. discloses oxygen nanobubbles having a size of 20-30 nm which are prepared by flowing liquids over hydrophobic surfaces (Column 7, lines 43-55). It is disclosed that nanobubbles allow higher concentrations of oxygen to be achieved in the aqueous solution and that the solutions can be prepared with physiological saline (Column 7, lines 44-65).

WO 03/0227356 disclose the production of ozone bubbles and ozonated water where the a dielectric barrier is used to effect the ozone bubbles. The difference between WO 03/0227356 and the claimed invention is that WO 03/0227356 does not expressly disclose the use of ultrasonic vibrations or circulating screwblades which have holes to effect the bubbles or oxygen bubbles that are 200 nm or less and where the water has a salinity concentration in the range of 0.01% to 3.5%.. However, the prior art amply suggests the same as JP 2002-307053 disclose the use of ultrasonic vibrations to effect the ozone bubbles, JP 60-122337 disclose the use of a rotation shaft with a screw blade which has thin holes to effect the ozone bubbles and McGrath

Art Unit: 1616

discloses that oxygen bubbles having a size of 20-30 nm can be prepared and physiological saline used as the carrier. As such, one of ordinary skill in the art would have been motivated to modify the prior art as above with the expectation by use of the same that similar to ozone bubbles that oxygen bubbles would exhibit increased dissolution into the water and that the aqueous solution would have a salinity falling within the claimed range of 0.01% to 3.5% via the use of physiological saline..

Therefore, the claimed invention, as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention has been collectively taught by the combined teachings of the references.

Conclusion

A facsimile center has been established in Technology Center 1600. The hours of operation are Monday through Friday, 8:45 AM to 4:45 PM. The telecopier number for accessing the facsimile machine is 571-273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Choi whose telephone number is (571)272-0610. Examiner maintains a compressed schedule and may be reached Monday, Tuesday, Wednesday and Thursday, 6:00 am – 4:30 pm (EST).

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Johann R. Richter, can be reached at (571)272-0646. Additionally, Technology Center 1600's Receptionist and Customer Service can be reached at (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frank Choi
Patent Examiner
Technology Center 1600
October 6, 2009

/Johann R. Richter/
Supervisory Patent Examiner, Art Unit 1616